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USDA RADIOLOGICAL MONITORING PROGRAM

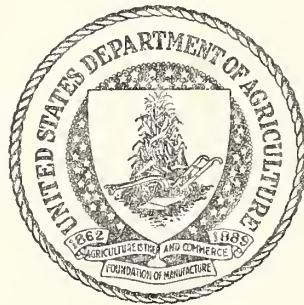
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USDA RADIOLOGICAL MONITORING PROGRAM

PART I - Introduction

The problems in the field of radiation and radioactive fallout on agriculture relate to the potential damage from radiation and radioactive fallout on the agricultural personnel, livestock, and other agricultural resources. It also would bring about economic losses resulting from protracted denial time dictated by the need to protect people who work with these resources. The radiation from fallout on surrounding environment, including the body surfaces, can result in damage or death to both man and animals. Ingested, in the form of contaminated food or water, relatively small amounts of radioactive fallout can cause delayed and longer lasting injury to humans and animals. Ingestion of larger amounts tends to produce serious injury earlier and may result in death. It is essential that defense measures include protection of food resources of this country against radioactive fallout and means for minimizing the effects of fallout on livestock, poultry, lands, and food crops.

Radiological monitoring provides essential information for protection, for survival, for recovery actions and for required restoration and remedial measures. Radiological monitoring provides intelligence or information relative to the presence or absence of radioactive materials in a particular area. Without this information, one would have little or no factual information upon which to base any required action or decision.

A. Assignment of Monitoring Responsibility

Monitoring is essential to determine the degree of contamination of personnel, objects, facilities, food and water, as well as determining where in the general environment decontamination is required and the effectiveness of decontamination measures. It is essential that monitoring services and information be available to the USDA to help determine its ability to conduct its field operations.

Annex 23 to the National Plan (National Radiological Defense Plan) under section V.I.2.6. states - "All Federal agencies having requisite capabilities will monitor radiation levels and furnish data to civil defense agencies - Federal, State, and local - as required."

Under section III.A.2. it further states - "All Federal agencies are responsible for protection of personnel at their own facilities against radiological contamination and for performing assigned nonmilitary radiological defense functions."

Note: Additional and detailed information will be available in the form of appendices to Annex 23 - National Radiological Defense Plan. Interim guidance is available in OCDM Advisory Bulletins, Technical Bulletins, and National Plan Series. See Exhibit E for list.

Section VI.B.5 states - "The Department of Agriculture shall prepare national emergency plans and develop preparedness programs for radiological defense as it affects livestock, crops, meat, and poultry, and agriculture generally."

Section VI.B.6 states - "The Department of Health, Education and Welfare shall provide results of research on biological effects of radiation and on the effects of radioactive contamination on food, drugs, and water (except that covered by USDA), develop standard procedures for collection and laboratory analysis of food, drugs and water samples, and assist in personnel training in the monitoring of water, food and drugs."

The Department of Agriculture, therefore, has requirements to: (1) develop and maintain a capability within its field forces for monitoring for the presence and intensity of radioactivity and providing recommendations and guidance to agricultural officials and farm and forest personnel on protection against, and remedial measures that might be taken to minimize, the radiation hazards from fallout on essential agricultural resources and food products therefrom; (2) provide a monitoring capability at all Department facilities, to the extent practicable, for the protection of Department personnel; and (3) provide trained personnel to man those Federal fixed monitoring stations that have been assigned to the U. S. Department of Agriculture (USDA) by the Office of Civil and Defense Mobilization (OCDM).

B. Assignments Within USDA

Secretary's Memorandum No. 1430, dated May 22, 1959 - "Responsibilities for Radiological Monitoring" assigns responsibility for radiological monitoring to several Department agencies with field organizations and established field programs. This memorandum provides the following information:

By delegations from the Office of Civil and Defense Mobilization (OCDM), the Department prepares plans for an emergency food and agriculture program. In the furtherance of such delegations and the carrying out of the Department's regular programs, this memorandum assigns responsibilities in the Department for leadership in developing, coordinating, and directing a nation-wide monitoring system on radioactive fallout as it concerns:

1. agricultural lands, including forest lands,
2. water used for agricultural purposes,
3. agricultural commodities stored or harvestable on farms and ranches,

4. livestock (including poultry),
5. meat and meat products and poultry and poultry products, and
6. agricultural commodities and products owned by CCC and the USDA.

It is the policy of the Department to provide an orderly and effective means for supplemental assistance to the local, State, and National civil defense authorities in determining the extent of and alleviating damage resulting from radioactive fallout as it relates to the items listed above. To this end, agencies assigned responsibilities by this memorandum shall mutually endeavor to formulate an integrated plan of action by the Department. In carrying out these responsibilities, agencies will recognize the need for consulting with other departments and agencies having responsibilities for radiological defense activities

The following agencies of the Department are assigned responsibility for this function in the areas indicated:

1. Agricultural Research Service (ARS). The Agricultural Research Service is responsible for all administrative functions on behalf of the Secretary relating to radiological safety within the Department (9 AR 200n). In this connection the ARS will make the necessary general arrangements with the OCDM for the acquisition, use, and disposition of monitoring equipment. ARS will arrange with OCDM, and by other means, for the training of instructors in the use of monitoring equipment; give general assistance to agencies of the Department in providing for an orderly program for the training of monitors, including special emphasis on the agricultural needs to be met through this program; develop and formulate the guidelines for use in determining the most efficient rehabilitation of affected agricultural lands and commodities; and coordinate radiological training and research within the Department and with OCDM.

The ARS, in conformity with over-all departmental coordination, shall plan and place in a state of continued readiness for implementation a system for the radiological monitoring of agricultural commodities in meat slaughtering and processing plants and public livestock marketing centers subject to continuing ARS inspection. This assignment includes the post-attack utilization of radiological information and determination, in conformity with

guidelines established by ARS, and in consultation with local civil defense authorities, as to the circumstances under which the commodities may be safely used.

2. Agricultural Marketing Service (AMS). The Agricultural Marketing Service, in conformity with over-all departmental coordination, shall plan and place in a state of continued readiness for implementation, a system for the radiological monitoring of poultry processing plants subject to continued AMS inspection. AMS will also develop a system for the radiological monitoring of agricultural commodities owned by the Commodity Credit Corporation (CCC) or USDA, except those stored on farms, ranches, or at bin sites. This assignment includes the post-attack utilization of radiological information and the determination, in conformity with general guidelines established by ARS and in consultation with local civil defense authorities, as to the circumstances under which the commodities may be safely used. AMS will begin on a small scale to include monitoring in the training of selected employees concerned with food management, and in consultation with agencies which have a primary responsibility, will be prepared to assist further in monitoring.
3. Soil Conservation Service (SCS). The Soil Conservation Service, in conformity with over-all departmental coordination, shall plan and place in a state of continued readiness for implementation a nation-wide system for the radiological monitoring of agricultural lands and waters, farm commodities stored or harvestable on farms, ranches, or at bin sites, and livestock safety. (Note: The term "agricultural lands" as used here excludes forest and other adjacent or intermingled lands described in item 4 below.) This assignment includes the post-attack utilization of radiological information and determination in conformity with guidelines established by ARS as to the circumstances under which lands may be returned to production and the farm produce and commodities safely used.
4. Forest Service (FS). The Forest Service, in conformity with over-all departmental coordination, shall plan and place in a state of continued readiness for implementation a system for the radiological monitoring of all lands within national forest boundaries, including tracts of privately-owned intermingled farm land and all State and privately-owned forest and range land protected by the Forest Service under cooperative agreements, within and adjacent to the national forests.

The States will have responsibility for radiation monitoring on State and privately owned forest lands protected from fire by the State Forestry organization, and such other monitoring as may be necessary to carry out their rural fire protection responsibilities. However, under its Rural Fire Defense delegation, the Forest Service may furnish the State Forestry organizations such limited advice and assistance in radiological planning and training as is practicable.

In planning and carrying out the foregoing specific responsibilities the agencies shall, with the over-all coordination of ARS, utilize the assistance of other Department agencies and cooperating agencies where factors of location and capability make that practicable. For this purpose, other agencies are authorized in such circumstances to designate and make available for training such of their personnel as may be effectively made a part of the Department's radiological monitoring services.

No assignments made by this memorandum modify in any way the responsibilities of the Director, Food and Materials Division, CSS, for Department liaison with OCDM.

PART II - Radiological Defense Training Program of USDA

Those USDA agencies with delegated responsibility in radiological monitoring must (a) develop and provide adequate numbers of qualified radiological instructors, the number being determined by the field organization of the agency; (b) provide, to the extent practicable, trained monitors for each Department installation where Department personnel work; (c) provide operational capability and knowledge within the field forces to perform the assigned responsibilities in Secretary's Memorandum No. 1430; and (d) provide four trained monitors for each Federal fixed monitoring station operated by the agency, except in those cases where there are fewer than four employees available. All of the above objectives should be established and maintained within the regular field forces as a part of the built-in readiness program required by Secretary's Memorandum No. 1376, Supplement 3, and USDA "Defense Mobilization Planning to Assure Continuity of Essential Functions in Event of Civil Defense Emergency," June 1960.

A. Training Radiological Defense Instructors

Instructors for the training programs will be developed in the following manner:

In compliance with requirements of the Atomic Energy Commission (AEC), instructors must attend an established and recognized five-day radiological defense instructor's course. The OCDM conducts radiological

monitoring instructor's courses at their Radiological Defense School, Battle Creek, Michigan; Eastern Instructor Training Center, Brooklyn, New York; and Western Instructor Training Center, Alameda, California. The Agricultural Research Service has permission from AEC and OCDM to conduct five-day training courses for radiological monitoring instructors for Department personnel only. Candidates who have successfully completed either the OCDM or ARS five-day instructor's course qualify as instructors of monitors and also, if required, for AEC licensing to handle radioactive materials for training purposes.

B. Training Radiological Monitors

Radiological monitors normally will be trained by their own agency. The course of instruction should generally follow the suggested agenda for a 2½-day course listed in the USDA Radiological Training Manual. Subject lectures, visual aids, and sources for visual aids and other instructional materials are listed in the manual.

C. Information and Refresher Courses

Atomic energy and radiological defense is a dynamic field with new findings being continually developed from observations, investigations, and research studies. In order to keep agricultural personnel informed, new findings and information will be distributed as they become available. Refresher courses will be essential to provide training and information on current research findings and their application to radiological defense and recovery programs. These courses would include discussions on revisions in monitoring techniques, operational procedures, protection standards, policies, and inspection and review of monitoring instruments. Such refresher courses would be of one to two days' duration and would be conducted when required and appropriate.

The general orientation course is one day. It can be used for general information to selected groups on the subject of atomic energy, radiation, and its effects on agriculture. Such a suggested course is also outlined in the training manual.

D. Reports on Radiological Defense Training

A semi-annual report requested by OCDM from Federal agencies will be made covering radiological defense training and operational capability to include:

1. A list of instructors trained, by name and address, and
2. The total number of monitors trained during the six-month period, and total to date.

Reports are due in the Washington office on January 1 and July 1.

Form AD-295, "Record of Formalized Training," will be filled out in the field for each employee qualified as instructor or monitor. A copy of the form for instructors will be forwarded to the Washington offices of the USDA agencies. (See - ARS Administrative Memorandum 440.3; FS Handbook; AMS Instruction 380-3; and SCS Management Handbook, Training Chapter of Personnel.)

E. Radioactive Source Sets

The Department, through its AEC license, authorizes qualified personnel to possess or use OCDM 30-millicurie cobalt-60 radiation source sets for training purposes. Those having custody of a radioactive source set are named on the Department's license from AEC. Those who will merely use radioactive source sets on a temporary basis receive letters of authorization from the Department's Radiological Safety Officer under the Department's AEC license. Those attending OCDM instructor's courses may obtain a letter of authorization for handling radioactive materials through their agency's Washington office to the Department's Radiological Safety Officer. Requests for authority to possess cobalt-60 source sets for training purposes will be made to the Department's Radiological Safety Officer by the Washington offices of the agencies with assigned training responsibilities. Authorization to possess or handle radioactive source materials will be sent directly to the individuals with copies to the agency's Washington and field offices.

Information on the location of the cobalt-60 radiation source sets for this Department, the Department of the Interior, and the Office of Civil and Defense Mobilization have been made available to the monitoring instructors. Department policy is to restrict the number of source sets within the Department to a minimum. Utilization of source sets from other departments and agencies should be made wherever possible.

The possessor of a radiation source set is responsible to the Department's Radiological Safety Officer for safe storage, use, and maintenance and is subject to AEC inspection.

F. Radiological Safety Handbook

All Department radiological defense instructors have been furnished the Department's Radiological Safety Handbook. All qualified personnel utilizing radiation sources must be thoroughly familiar with the contents of this handbook and the procedures to be followed in the transportation, use, and storage of the radioactive material. The safety handbook is provided at the same time as the authorization for handling radioactive material by the Department's Radiological Safety Officer, Agricultural Research Service, Beltsville, Maryland.

Those agencies of the Department that have custody of a radiation source set may loan it for training purposes to Department personnel who possess the appropriate letter of authorization signed by the Department's Radiological Safety Officer. Loans to personnel other than USDA may be made on proof and possession of a valid AEC license to have custody of and use of OCDM CD V-786 or 784 source sets for training purposes. Radiation source sets from other departments, or State and local civil defense agencies, may be obtained by the presentation of the Department's letter of authorization and proper identification.

The movement of radiological source sets must be made in compliance with the State and local laws and regulations, usually found in the State Health Department, and the Department's radiological safety requirements. The Department's Radiological Safety Officer should be notified in advance (by at least two weeks) if a source set is to be moved for training purposes across State lines, since he has on file, for those States requiring them, the necessary registration or reporting forms which govern the introduction of sources of radiation into the several States.

G. Property Accountability

Approved methods for developing and establishing property records will be maintained by each agency possessing monitoring instruments and equipment furnished by OCDM. Records should be maintained by location, instrument type, model, and serial number.

Each agency is responsible for its own instrument maintenance, including batteries (see OCDM Advisory Bulletin No. 242 for details on repair procedures.)

H. Personnel Protection

USDA Radiological Safety Handbook, Section 3 - "Rules Affecting Personnel," will be rigidly applied. Paragraph 3.3 of this section requires a Personnel Radiation Exposure Report (Department Form QA-22 - See Exhibit A) for training programs, or other exposures. This report should be sent to the Department's Radiological Safety Officer, Agricultural Research Service, Beltsville, Maryland, currently after each training session or inspection of source set. Exposure records must be kept for both instructor and trainees. The dosage received by one trainee can be applied to all trainees present.

In addition, instructors or source set custodians must maintain a cumulative record of exposure by individuals for use in preparing QA-22 reports and for AEC inspection.

Unauthorized persons will be kept a safe distance from source material to prevent exposure.

PART III - Communications Relating to Radiological Monitoring

A. General Understanding Regarding Coverage and Exchange of Data

The USDA State Emergency Planning Committee (EPC) Chairmen and the USDA County Emergency Planning Committee Chairmen should agree with State and local governments on the types of monitoring information essential to food and agriculture and rural fire defense and how such information should be obtained in an emergency. In addition to providing the OCDM Regional Office with reports from the Federal fixed stations manned by USDA in accordance with established procedures, USDA will also provide local government with reports, where practical, of fixed monitoring and additional monitoring that may be done by USDA representatives. Local government, in turn, should agree to provide USDA County EPCs with composite monitoring data from sources available to them that would be helpful to agriculture. If necessary, there will be a supplemental exchange of monitoring information at the State level.

B. Monitor Reports

Monitor reports prepared by USDA personnel manning Federal fixed stations will be submitted to OCDM according to established procedures.

In addition, monitor reports prepared by USDA personnel at Federal fixed stations or other locations in the county will be submitted to the Chairman of the USDA County Agriculture Defense Board. The Chairman of the USDA County Agriculture Defense Board will transmit the reports to local government. Local government will provide the Chairman of the USDA County Agriculture Defense Board with composite monitor reports which would be helpful to agriculture. The Chairman of the USDA County Agriculture Defense Board will see that all monitor reports received are available to USDA agency representatives at the county level so they can be used in evaluating effects of attack as a basis for determining necessary protective actions and certain other program activity. As communications permit, the Chairman of the USDA County Agriculture Defense Board will transmit the significant conclusions from monitor reports to the USDA State Administrator.

The USDA State Administrator will make the monitoring information which he receives available to State government and will receive from State government composite monitor reports which would be useful to USDA. The USDA State Administrator will make monitor reports available to USDA agency representatives at the State level so they can be used in evaluating the effects of attack as a basis for necessary program actions.

The USDA State Administrator will make estimates of effects of attack available to the Regional Liaison Representatives (RLRs) and to USDA national headquarters whenever communications permit.

PART IV - Rural Radiological Monitoring

A. Monitoring and Reporting Requirements (Rural Areas)

A monitoring and reporting service provides the basis for evaluation and control of radiation exposure of the rural population, livestock, and poultry. Monitoring also provides a basis for recommended land use and general evaluation of the degree of contamination of agricultural commodities stored or harvestable on farms and ranches. This information will be made available to USDA representatives and others in accordance with the pattern in Part III above.

B. Responsibilities

1. General

The National Plan, under Section V, "Functions for Protection of Life and Property," states in paragraph 1.2.a., "Local authorities will monitor the areas for radiological contamination, identify the degree and location of the radiological hazards, report such hazards to the State and"

Annex 23 to the National Plan states in paragraph IV.A.4, "Monitoring systems will be developed at all levels of government to detect and evaluate the hazards resulting from an attack . . . State and local systems will provide detailed monitoring services for operational use."

As indicated previously, paragraph VI.B.5 states that the Department of Agriculture shall prepare national emergency plans and develop preparedness programs for radiological defense as it affects livestock, crops, meat and poultry, and agriculture generally.

Since the National Plan, supported by Annex 23, gives the specific directive to State and local governments to develop monitoring and reporting systems, that is their prime responsibility. The broad, and heavy, responsibility placed on the USDA by Annex 23 does not specifically direct USDA to perform those functions. In order to avoid duplication of equipment, training, and personnel requirements, the following division of responsibilities should be observed.

2. Local Government

- a. Establish local procedures for monitoring and reporting necessary for the evaluation and control of radiation exposure of the (rural) population, livestock, and poultry.

- b. In conjunction with representatives of USDA, establish local procedures for the radiological monitoring and reporting (or mapping) of contamination of privately owned (a) farmland and (b) agricultural commodities.
 - c. Establish monitoring and reporting systems to supply the intelligence necessary for the short and long range protection of the lives and property of (rural) people. Appropriate monitoring information should be made available respectively to the local government and to USDA representative(s).
 - d. Perform other appropriate radiological defense functions as directed in appendices (currently being prepared) to Annex 23 of the National Plan.
3. The Department of Agriculture (Local Representative)
- a. In conjunction with the local civil defense office, establish local procedures for the radiological monitoring and reporting (or mapping) of contamination of privately owned (a) farmland and (b) agricultural commodities (stored or harvestable).
 - b. Based upon local monitoring information and USDA guidance, recommend appropriate (a) use of agricultural lands, (b) use or disposition of agricultural commodities, and (c) care or disposition of livestock.
 - c. In conjunction with the local civil defense, advise the farm population on precautions to take to minimize radiation exposures associated with important farm work, i.e. denial time, stay time, shielding required, etc.
 - d. Perform other radiological defense functions as assigned under OCDM delegations to the USDA.

C. Organization

1. General

The organization of local government varies significantly from State to State. However, in most States the element of government most active in administering agricultural programs is the county. For that reason it is expected that radiological defense for agricultural areas will be organized and administered primarily from the seat of county government.

In those States where organization of political subdivisions or where local conditions make it necessary, agricultural radiological defense may be centered in government organizations other than the county.

2. Staff

No attempt is made to present a detailed staffing pattern. However, the following personnel will be among those concerned with the joint responsibility for local agricultural radiological defense:

- a. County civil defense director (policy)
- b. County radiological defense officer
- c. Chairman, USDA County Emergency Planning Committee^{1/}
- d. Local representative of the AMS, ARS, ^{1/}FS, and SCS having radiological defense responsibilities^{1/}

D. Operational Plans (Joint USDA and Local Functions)

Since farm size, land use, terrain, road systems, and communications requirements will vary greatly from area to area, detailed plans will vary and must reflect local conditions. The following are general statements of items for such a detailed plan.

1. USDA (Local representative) will provide guides and procedures for that part of the monitoring required for evaluation of:
(a) acceptable land and farm water use; (b) the degree of contamination of agricultural commodities, stored or harvestable on farms, ranches, and at bin sites, forests and forest products; and (c) the probable effects on livestock and poultry.
 - a. For land use, except national forest lands, Soil Conservation Service, USDA, will recommend:
 - (1) The spacing of the monitoring grid (at section line corners, at 1/2 mile by 1/2 mile intervals, etc.). This item of the plan should be subject to post-attack revision for those areas where fallout deposition is quite irregular. Such a condition may exist when there was precipitation or severe

^{1/} See paragraphs on "Communications and General Understanding on Coverage and Exchange of Data," Part III.

atmospheric turbulence during the period of deposition of fallout, and when fallout over rough terrain is accompanied by relatively strong surface winds. Early monitoring performed for the safety of people and property should indicate whether or not deposition was markedly irregular.

- (2) Methods of reporting, plotting, and mapping the radiological defense (RADEF) situation.
 - (3) In conjunction with the county radiological defense officer, determine when monitoring for land or water use evaluation should be undertaken.
 - (a) Dose rates decayed to intensity low enough to present acceptable hazard to monitors.
 - (b) Dose rates high enough for measurement with OCDM survey instruments.
- b. AMS, ARS, FS, and SCS will plan the extent and methods of carrying out the additional monitor assignment indicated in Secretary's Memorandum No. 1430 summarized in Part I.B. above.
 - c. The Food and Drug Administration, in cooperation with their State and local government counterparts, is responsible for monitoring food for radiological, chemical, and biological contamination with the exception of food and related items assigned to USDA. Plans for such monitoring should be worked out in cooperation with USDA and State and local governments.
2. In an emergency, the USDA County Agriculture Defense Board will apply USDA criteria in recommending:
 - a. Disposition to be made of commodities, livestock and poultry
 - b. Utilization of land
 - c. Other disposition relating to food and agriculture, and forest lands within the county.
 3. The county civil defense will perform radiological defense functions in conformance with directives in the National Plan, Annex 23, and its appendices. Those functions will include

the development of monitoring and reporting capability in accord with USDA requirements listed above in paragraph D.1.

PART V - Federal Fixed Monitoring Stations

A. Monitoring and Reporting Requirements

The Federal fixed monitoring stations of OCDM provide a nation-wide network of monitoring capability and reporting service. It is being established by OCDM and uses the facilities and capabilities of Federal agencies, including the USDA. The Department has been assigned a total of 1,900 monitoring stations in the OCDM network in the national forests, rural areas, public livestock marketing centers, and meat and poultry slaughtering and processing plants subject to Federal inspection. This assistance will be provided by AMS, ARS, FS, and SCS and is in addition to the continuing assignments of responsibility for more intensive radiological monitoring for agricultural purposes. The entire Federal network will include approximately 3,400 stations scattered throughout the country.

The Federal fixed monitoring services will determine radiation intensities and report them to OCDM at the national level. This radiological intelligence will serve as a basis for general analysis of the over-all fallout situation during an early post-attack period. This information will help support command decisions for restoration of communications and transportation, and the allocation of critical resources from areas of surplus to areas of short supply. The radiation measurements at each Federal net installation will be reported to the appropriate local government.

The USDA will be vitally concerned with the interpretation and application of fallout data in conducting its emergency operations and delegated defense responsibilities, and to determine its ability to sustain field operations in a fallout area. This information will be made available to USDA representatives and others in accordance with the pattern in Part III above.

Those who are responsible for the operation of Federal fixed monitoring stations assigned to USDA should be guided by the following procedures.

B. Peacetime Operation of Fixed Monitoring Stations

1. Care of Instruments

Check batteries and instruments once per month to insure operability.

Check instruments outdoors once per month and prepare simulated message.

Participate in planned exercises as instructed.

2. Reports

A "Record of Radiological Reports - Federal Fixed Monitoring Network" report form is used for each fixed monitoring station (see Exhibit B).

Each station will record monthly operability checks, shipping of instruments for maintenance, and return of repaired instruments.

Monthly practice messages will be prepared in the following format for stations not having FAA Service A or teletypewriter communications:

ddtttt eeerrr

where:

dd is the day of the month
tttt is the time in Greenwich Meridian time
eee is a 3 letter designator for the monitoring stations
rrr is the observed dose rate to the nearest whole number

Sample Message

290300 TOV280
29 indicates the fallout observation was taken on the
29th of the month
0300 indicates the observation was taken at 0300 hours
GMT
TOV indicates the location of the monitoring stations --
in this case the Soil Conservation Service Office at
Merced, California
280 indicates that the observed dose rate was 280r/hr.

These 3 letter station designators (eee) are being assigned by OCDM in its appendix 2.6 to Annex 23 of the National Plan for Civil Defense and Defense Mobilization.

In the event that nuclear weapons are employed against the Nation, or in case of a nuclear accident, the observed dose rate will be reported as "ZERO" until it reaches or exceeds 0.5r/hr. Thereafter, as long as the observed dose rate equals or exceeds 0.5 roentgen per hour, it will be reported as the nearest whole roentgen per hour, except as stated below. For example: 1.4r/hr would be reported as "001" and 1.5r/hr would be reported as "002."

However, when a dose rate higher than 1r/hr has decayed to less than one roentgen per hour, it will be reported in tenths, hundredths, and thousandths of roentgen per hour. For example, 80r/hr would be reported "080"; 220r/hr would be reported "220"; 1/10r/hr would be reported ".100"; 50mr/hr would be reported ".050", etc.

These messages should be attached to the Record of Radioactivity Measurements. Completed reports for a six-month period will be handled as follows:

- AMS and ARS - Reports will be sent to the agency's Washington office for review by January 20 and July 20¹/. They will then be forwarded to CBR Defense, OCDM, Battle Creek, Michigan.
- FS - Reports will be sent to the Regional Forester for review by January 20 and July 20. They will be forwarded to CBR Defense, OCDM, Battle Creek, Michigan.
- SCS - Reports will be sent to the office of the State Conservationist for review by January 20 and July 20. They will be forwarded to CBR Defense, OCDM, Battle Creek, Michigan.

C. Operation of Fixed Monitoring Stations When Attack Imminent

The following courses of action will serve as a check list of appropriate pre-attack readiness procedures:

1. Insert batteries in instruments not in daily use and perform standard operability checks.
2. Charge dosimeters.
3. Check availability of outer clothing and supplies for minimizing contamination of the persons who will perform out-of-doors monitoring.
4. Check communications in accordance with standard operating procedures.
5. Check availability of recording forms, pencils, and equipment required as well as equipment needed subsequently for outdoor monitoring, such as flashlights, clipboards, etc.

1/ The OCDM publication, "Operation of Federal Fixed Monitoring Stations," contains additional detailed instructions on this subject.

6. Place vehicles required for later mobile activity under cover to avoid contamination.
7. Alert off-duty personnel to report to assigned stations or alternate stations in accordance with your agency's operating plans.

D. Operation of Fixed Monitoring Stations When Emergency Occurs

During the initial emergency period, the field monitoring stations of the Departments of Agriculture and Interior will report to the appropriate OCDM regional office collect via priority commercial message as follows:

1. Initial Dose Rate Observations and Reports

In an emergency (nuclear war or major peacetime nuclear disaster) the level of radiation (dose rate) should be determined each hour, on the hour. During the first few hours of the emergency, it is preferable to monitor more frequently (every one-half hour if practicable) in order to detect the first arrival of fallout and in order to obtain a more accurate measurement of extreme or maximum dose rate values. Appendix 2.5 to Annex 23 of OCDM's National Plan for Civil Defense and Defense Mobilization provides practical guidelines for carrying out monitoring operations with minimum radiation exposure of monitoring personnel.

When the dose rate is initially observed to equal or exceed 0.5r/hr, this occurrence should be noted on the reporting form along with the date and time of the event; and THE EVENT SHOULD BE REPORTED IMMEDIATELY TO THE APPROPRIATE OCDM REGIONAL OFFICE COLLECT VIA PRIORITY COMMERCIAL MESSAGE.

(See Exhibits C and D for Reporting Channels. These exhibits cover reporting within OCDM and State and local government channels. They do not cover the additional reports required within USDA at State and local levels. For reporting as it relates to USDA, see Part III above.)

The appropriate OCDM regional office is the one in whose area the monitoring station is located. An "OCDM Regions" map is attached. In case communication with the indicated regional headquarters cannot be accomplished, messages may be addressed to the headquarters of an adjoining Region. The message will be in the same format as indicated in the previous section, i.e.,

ddtttt eeerrr

where:

rrr is the dose rate (equal to or exceeding 0.5r/hr)
observed at station eee on the dd day of the month
at tttt Greenwich Mean Time (GMT).

2. Subsequent Dose Rate Observations and Reports

After this initial report of fallout occurrence, dose rate observations should be made at least once an hour, on the hour, reported and recorded on the record form which has been furnished. From 12 hours through 24 hours after fallout arrival, dose rate observations will be taken each three hours, reported and recorded on the form. The three hourly observations of dose rate will be taken at 0300, 0600, 0900, 1200, 1500, 1800, 2100, and 2400 GMT (see Time Conversion Table below.) From 24 through 48 hours after fallout, dose rate observations will be taken each 6 hours, reported and recorded on the form. The six hourly observations of dose rate will be taken at 0300, 0900, 1500, and 2100 GMT. Subsequent to 48 hours after arrival, dose rate observations will be taken daily, reported and recorded on the form. The daily observations will be taken at 0300 GMT.

Time Conversion Table

<u>Greenwich</u> <u>Mean</u> <u>Time</u>	<u>Eastern</u> <u>Standard</u> <u>Time</u>	<u>Central</u> <u>Standard</u> <u>Time</u>	<u>Mountain</u> <u>Standard</u> <u>Time</u>	<u>Pacific</u> <u>Standard</u> <u>Time</u>
0300	2200	2100	2000	1900
0600	0100	0000	2300	2200
0900	0400	0300	0200	0100
1200	0700	0600	0500	0400
1500	1000	0900	0800	0700
1800	1300	1200	1100	1000
2100	1600	1500	1400	1300
2400	1900	1800	1700	1600

A marked increase of dose rate following a period of decay indicates the arrival of additional fallout. This information is valuable in planning survival operations, and the maximum dose rate observed and time of occurrence should be noted on the record form. Also, whenever a marked increase of dose

rate is observed, a new series of hourly observations should be undertaken for the next 12 hours followed by three hourly observations for the period 12 to 24 hours after the increase. This should be followed by six hourly observations from 24 to 48 hours after the event and daily observations thereafter in accord with the above schedule.

Reports will be made to the appropriate OCDM Regional Office in accord with the above prescribed standardized format as soon as possible after the observation has been taken.

After the national radiological communications system is implemented, all dose rate observations will be reported to OCDM over this network. However, during the interim period, to avoid overloading available communications, reports will be made on a less frequent basis as follows:

- a. Initial report when dose rate equals or exceeds 0.5r/hr.
- b. For the first 12 hours after the arrival of fallout dose rate reports will be made at three hour intervals based upon observations taken at 0300, 0600, 0900, 1200, 1500, 1800, 2100, and 2400 GMT.
- c. During the period 12 to 48 hours after the initial report of fallout occurrence, dose rate reports will be made each six hours based upon observations taken at 0300, 0900, 1500, and 2100 GMT.
- d. Dose rate reports daily after 48 hours based upon observations taken at 0300 GMT. Whenever a marked increase of dose rate following a period of decay is noted, a new series of three hourly reports should be initiated followed by the six hourly and daily reports as indicated above. When the dose rate has reached a maximum value and has begun to decrease, the maximum observed value and time of occurrence should be appended to the next regularly scheduled report as follows:

ddtttt eeerrr max t't't't'r'r'r'

where:

ddtttt is the date and time of the regularly scheduled dose rate observation from station eee, and rrr is the observed dose rate. The word "max" means a maximum value of dose rate has occurred and the dose rate has

begun to decrease since the last reporting period. It occurred at time t't't't' (GMT) and the value of the observed maximum dose rate was r'r'r'. Whenever any marked increase of dose rate is observed and subsequent maximum values are reached, these maximum values and times of occurrence should also be appended to the next regularly scheduled report.

Reports of no fallout are just as important for survival operations as specific dose rate reports. According to the above general instructions, monitoring stations will not begin to report dose rates until the observed rate equals or exceeds 0.5r/hr. However, if the dose rate does not reach 0.5r/hr, field stations of the Departments of Agriculture and Interior should report this fact once each 12 hours during the first 48 hours after attack. No additional reports need be filed thereafter unless the dose rate equals or exceeds 0.5r/hr, in which case the previously described routine of reporting procedures will be followed. The "no fallout" reports will be made at 0300 and 1500 GMT in the following format:

ddtttt eeezero

where:

ddtttt and eee have the same meaning as before and the word "zero" means that the dose rate has not reached or exceeded 0.5r/hr.

3. Outside, Unsheltered, Accumulated Radiation Dose Reports
(Emergency Period Only)

In addition to dose rate monitoring and reporting, the stations of the Departments of the Interior and Agriculture will measure the outside, unsheltered, accumulated radiation dose in accordance with the directives below. OCDM has initiated negotiations with the Air Weather Service, Federal Aviation Agency, and the Weather Bureau, seeking an agreement for their monitoring stations to perform the additional emergency function.

Stations of the monitoring network will measure the outside, unsheltered, accumulated radiation dose as of 0300 GMT each day after fallout arrives; and will report this information as soon after 0300 GMT as feasible. Radiation dose measurements will be made in accordance with the procedures presented in Appendix 2.5, "Radiological Defense Monitoring Operations," to Annex 23 of the National Plan. Reports will be forwarded each day for

at least six days after the last detonation affecting the area and will indicate the total outside, unsheltered radiation dose from the first arrival of fallout to 0300 GMT on the reporting day. The radiation dose report will be of the following format:

dose eeerrrr

where:

"eee" is the station identifier, the word "dose" is included to avoid confusion with dose rates, and "rrrr" is the total dose in roentgens to date.

Since reporting is daily at a standard hour, 0300Z, it will not be necessary to state the hour in the coded report. Actually, the radiation dose report will be added to the 0300Z dose rate report, making a combined single message. In this instance the station identifiers will be used only once and the message format for the Departments of Agriculture and Interior will be:

ddtttt eeerrr dose rrrr

It is realized that most government facilities do not operate around-the-clock. However, in the event of nuclear war rescheduling emergency field functions is strongly urged to provide "round-the-clock" monitoring service at least for the first few days post-attack. To provide this service it is recommended that four monitors be trained at each station. However, if there are fewer than four people assigned to a particular facility, the monitoring station still should be established and the reporting schedule adjusted to the personnel capability of the particular station. Additionally, to guarantee ability to sustain operations in a fallout area, it is desirable to have a degree of fallout protection at the facility. However, this does not mean that a special shelter must be installed before a monitoring station can be established. The first floor of a building provides some protection; a basement considerably more; and the middle floors of a multistory building provide excellent protection.

4. Reporting to Local Government

In addition to reporting radiation information directly to OCDM, the field facilities of the fixed Federal monitoring

network will furnish reports of dose rates and accumulated radiation dose to local governments in the areas where the facilities are located. These reports will be provided in a format and in accordance with schedules agreed upon with local government officials.

5. Other Reporting

In an emergency, monitored reports submitted by the fixed Federal monitoring stations will also be made available to Federal agencies at their relocation sites through OCDM Regional and National offices. Some of the monitoring stations will be lost from the attack itself, and communications with some of the surviving stations may be destroyed. However, with 3,400 widely dispersed locations and reliable communications, the necessary radiological intelligence required should be available to adequately advise the OCDM Director, the President, and his staff so that proper and prompt decisions can be made for the survival and recovery of the Nation.

6. Maintenance of Fixed Monitoring Station Equipment

Instructions for maintenance and performing operational checks of radiological instruments are found in OCDM Advisory Bulletin No. 242 and its attachments A and B.

For a state of continued readiness, fresh batteries must be available for all monitoring instruments. Store batteries in a cool, dry location. Where feasible, batteries can be wrapped in plastic or other moisture proof material and placed in refrigerated storage, greatly extending the shelf life.

For repairs beyond suggested adjustments outlined in OCDM Advisory Bulletin No. 242, ship instruments to designated OCDM repair center.

Special attention will be given to transportation and use of radiological equipment to prevent damage.

- a. In monitoring, the equipment either should be carried by hand or transported in shockproof boxes designed for the specific instrument.
- b. Care should be taken in turning off the instruments during period of non-use to conserve batteries.

- c. Batteries should be removed from all instruments when they are not to be used on the succeeding day.
- d. Monitoring equipment will be checked for proper operating conditions a minimum of once each month.

7. Use of Fixed Station Monitoring Equipment

Fixed station monitoring equipment can be used in area monitoring only if the supply of other equipment is inadequate, and under the following conditions:

- a. When a nuclear detonation or reactor accident has occurred in the area in peacetime.
- b. When the primary post-attack purpose of the fixed station has been met; i.e., when the reporting frequency has dropped to two or four observations a day, the fixed station monitoring equipment may be used in the field for area monitoring, provided such use will not interfere with the monitoring and reporting schedule of the fixed stations. Survival considerations will be the controlling principle in determining if, and when, fixed station equipment will be removed from the station for area monitoring.

PART VI

Part VI will be added as soon as it is developed. The sections of Part VI will be prepared by the several agencies of the Department having delegated monitoring responsibilities. These sections will include specific technical instructions and procedures to agency field personnel relative to conducting their monitoring activities and assignments.

U. S. DEPARTMENT OF AGRICULTURE PERSONNEL RADIATION EXPOSURE REPORT			1. AGENCY		
INSTRUCTIONS: Complete in duplicate. Forward original to the Radiological Safety Officer, Radiological Safety Committee, Plant Industry Station, Beltsville, Maryland.			2. DIVISION, BRANCH AND SECTION		
			3. ADDRESS		
4. RADIOLOGICAL SAFETY COMMITTEE IDENTIFICATION		5. SOURCE		6. PERIOD OF REPORT (From - To)	
NAME A	BADGE OR METER IDENTIFICATION B	WORN 1/ C	TYPE OF USE 2/ D	TOTAL HOURS OF USE E	EXPOSURE REPORTED (Milliroentgens) F
7. REMARKS					
8. TITLE		9. SIGNATURE			10. DATE

USE CODE: 1/ Worn: W - WAIST C - CHEST A - ANKLE OTHER (Specify)
 2/ Type of use: C - CALIBRATION F - FIELD L - LABORATORY OTHER (Specify)

RECORD OF RADIOLOGICAL REPORTS
FEDERAL FIXED MONITORING NETWORK

Department _____

Station _____

Agency _____

County & State _____
(or similar designator)

Month	Date 19 __ Day	Time 24-Hr. Z Clock	INSTRUMENT USED - CD				Batteries Removed Yes - No	Observer's Initials	If Battery Corrosion Present, List Instrument	List CD V-750 if Inoperative and Disposition	Remarks
			V-700	V-710	V-720						
			Mod. No.	Mod. No.	Mod. No.						
			DOSE	RATE							
			mr/hr	r/hr	r/hr	r/hr					

See Instructions on Reverse

RECORD OF RADIOLOGICAL REPORTS
FEDERAL FIXED MONITORING NETWORK

INSTRUCTIONS

On January 1 and July 1 forward the completed record to the appropriate supervisory office of your Agency.

Name or Title _____

Organization _____

Address _____

The form on the reverse side is designed to provide a record of weekly radiological procedures for a semi-annual period during peacetime, or hourly radiation dose rate observations for a 24-hour day in time of emergency. The form also will furnish the supervisory stations, to whom the form will be mailed semi-annually, a check of the electronic failures of the various instruments and an indication as to the batteries required by each station for the monitoring.

A brief discussion of the various columns follows:

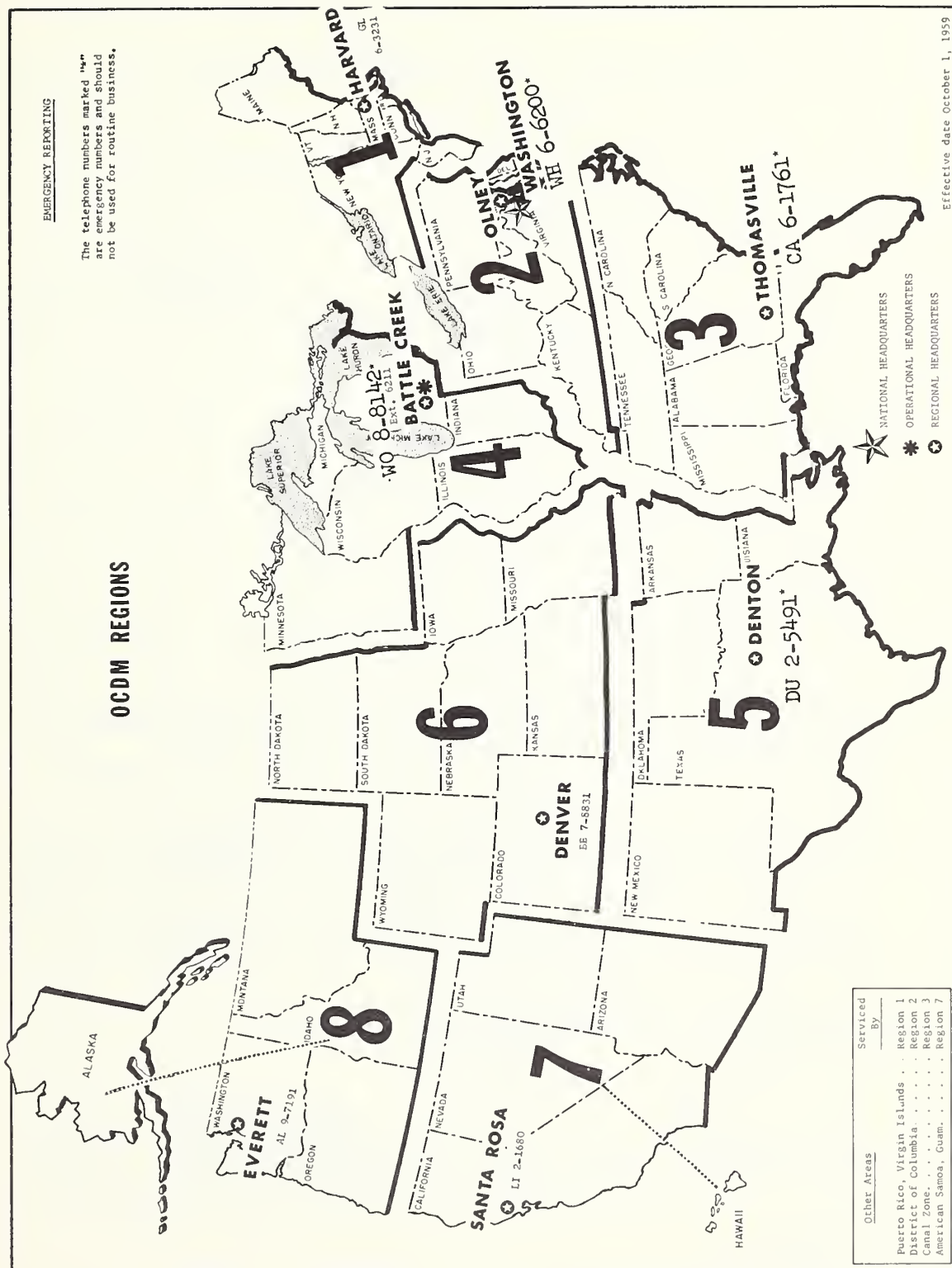
1. Date--This column is self-explanatory.
2. Time 24-Hour Z Clock--All reports are to be entered using the 24-hour Z Clock, the Z meaning the same as Greenwich Mean Time. For stations on Eastern Standard Time, five hours will be added to the Eastern Standard Time; Central Standard Time will add six hours; Mountain Standard Time must add seven hours; and Pacific Standard Time must add eight hours. For example, if the time is 11 o'clock a.m. Pacific Standard Time, Z time would be 11 plus 8 or 1900 Z time.
3. Instruments Used--Beneath this heading are columns listing three types of monitoring instruments. In each "Instrument Used" column there is the abbreviation, "Mod. No." for recording the instrument model number. Enter the model number of the instrument in the space provided. The supervisory officer, by having available the instrument type and the model number, can ascertain what batteries will be required. During non-emergency periods the background radiation reading will be entered in the V-700 column. On the V-710 and V-720 normal background radiation should not produce readings above the allowable tolerances as indicated in Attachment "B" to AB-242, and if within the allowable tolerance should be recorded as "0". When an instrument is inoperative, enter "I" in the appropriate column. If it is shipped for repair, place "S" in appropriate column. When the instrument is returned, place "R" or the meter reading in the appropriate column and list the model number in the remarks column if the instrument was replaced. The use of these letters as stated will inform the supervisory personnel the times an instrument had maintenance and so enable them to compute the cost of transportation as well as the reliability of the various models under their supervision. When an instrument is replaced the model and serial number of the replaced instrument should be indicated in the remarks column so that the check on battery requirements may be obtained.
4. Batteries Removed--Corrosion resulting from battery fumes or leakage can damage an instrument beyond the limit at which it can be economically repaired. If observations are to be taken hourly, there is no need to remove the batteries between observations. However, where observations are taken weekly, batteries are to be removed and that action recorded.
5. Observer's Initials--This is self-explanatory.
6. Battery Corrosion Present--At times there may be small areas of corrosion in the battery compartment of the monitoring instruments. If present, corrosion should be removed immediately and after being indicated as present in this column, the statement, "corrosion removed" should be entered under "Remarks." If corrosion cannot be removed and the instrument is damaged to the point of inoperability, indicate this in "Remarks."
7. Condition of CD V-750--This is the dosimeter charger and has been listed so that the supervising personnel will have a record as to the operability and maintenance required on these instruments.
8. Remarks--Under this column the observer may enter any appropriate remarks concerning the readings or existing conditions.

EXHIBIT B CONTINUED

EMERGENCY REROUTING

The telephone numbers marked "W" are emergency numbers and should not be used for routine business.

OCDM REGIONS



Effective date October 1, 1959

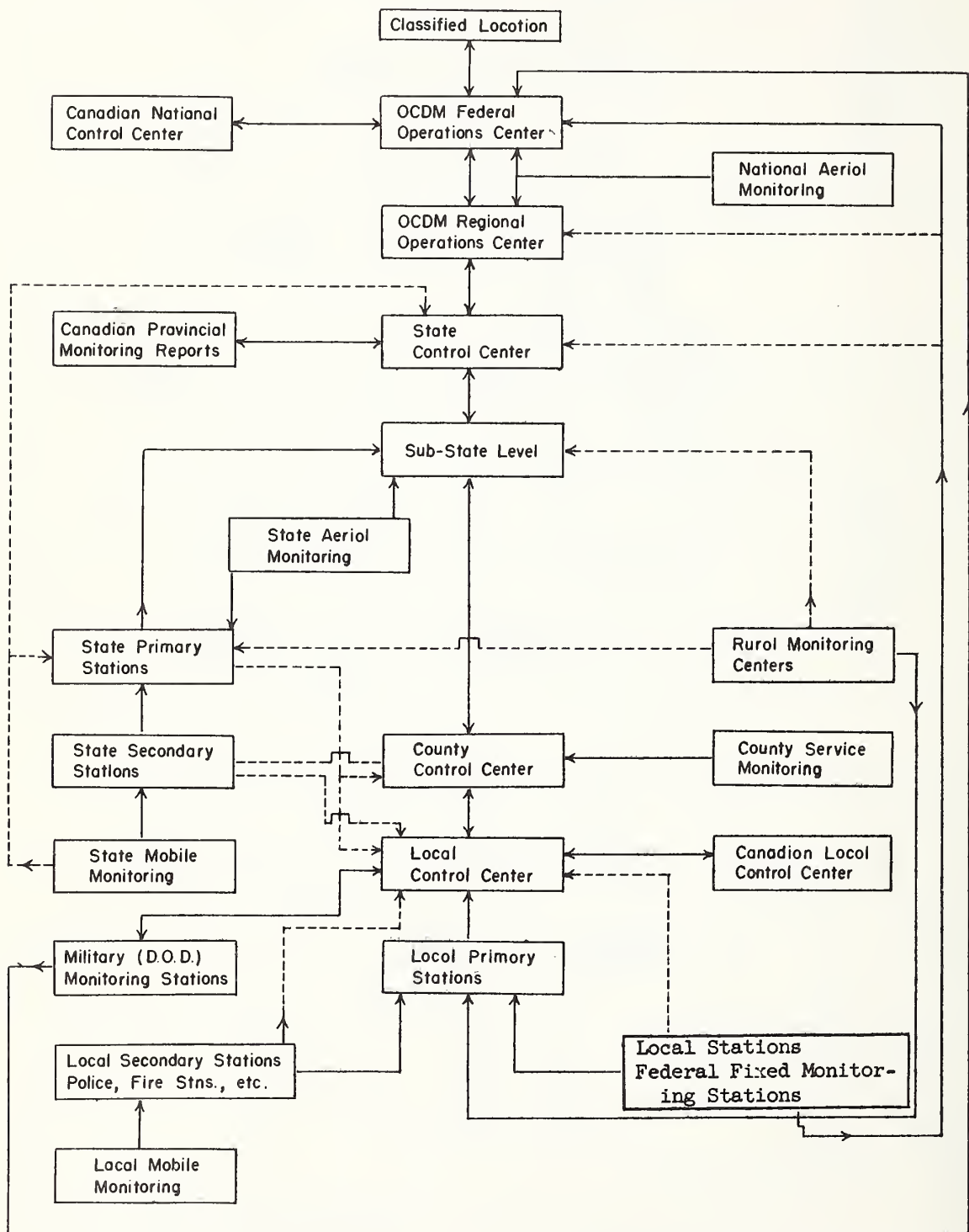
For additional information see Part III of this Manual.

EXHIBIT C

RADIOLOGICAL DEFENSE COMMUNICATIONS ROUTING

—BASIC ROUTING

----ALTERNATE ROUTING



For additional information see
Part III of this Manual.

EXHIBIT D

REFERENCE MATERIAL

Office of Civil and Defense Mobilization Publications

National Plan Series

National Radiological Defense Plan - Annex 23
Fallout Shelter Surveys: Guide for Architects and Engineers -
NP-10-2

Appendices to Annex 23

- Appendix 1.1 - Radiological Defense Requirements for Monitoring Stations and Personnel
- Appendix 2.1 - General Radiological Defense Operations
- Appendix 2.2 - Interim External Gamma Radiation Exposure Criteria
- Appendix 2.3 - Radiological Fallout Protective Measures
- Appendix 2.4 - Fallout Area Forecast Plots from Weather Bureau
UF Messages
- Appendix 2.5 - Radiological Defense Monitoring Operations
- Appendix 2.6 - Emergency Reporting Procedures for Radiological Defense
- Appendix 2.7 - Role of the CBR Defense Officer in Preattack and Postattack Radiological Defense Operations
- Appendix 2.8 - Radiological Decontamination
- Appendix 3.1 - Radiological Instruments for Training and Operation (Presently Technical Bulletin-11-20)
- Appendix 3.2 - Maintenance of Radiological Instruments Issued to Federal Agencies (Presently Advisory Bulletin No. 242)
- Appendix 4.2 - Fallout and the Winds (Presently Technical Bulletin-11-21)

Although most of their contents will be included in forthcoming appendices to Annex 23, the following OCDM publications will provide interim guidance in several areas:

Advisory Bulletins

- AB-73 - Clothing for Protection Against Nuclear and Thermal Radiation
- AB-128 - Instructions for Civil Defense Marking of Contaminated Areas

Technical Bulletins

- TB-11-8 - Permissible Levels of Radioactivity in Water and Food
- TB-11-9 - Emergency Measurement of Radioactivity in Food and Water
- TB-11-22 - Radiation Physics and Bomb Phenomenology

U. S. Department of Agriculture Publications

USDA Radiological Training Manual

USDA Radiological Safety Handbook

ARS Special Report 22-55, Radioactive Fallout in Time of Emergency,
Effects Upon Agriculture

Farmers' Bulletin 2107, Defense Against Radioactive Fallout on the
Farm

Films

A is for Atom

Basic Physics of an Atom Bomb

Fallout and Agriculture

Mission Fallout



Growth Through Agricultural Progress

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